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HUFFMAN LAW GROUP, P.C.
1832 N. CASCADE AVE.
COLORADO SPRINGS, CO 80907-7449

EXAMINER	
ZHONG, CHAD	
ART UNIT	**PAPER NUMBER**
2152	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/784,761	PETTEY, CHRISTOPHER J.	
	Examiner	Art Unit	
	Chad Zhong	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-45 are presented for examination.

The Affadavit filed on 9/29/04 under 37 CFR 1.131 has been considered but is ineffective to overcome the Beukema reference.

Affadavit is not proper – it must be signed by Inventor, or a reason given why Inventor could not be reached. See MPEP 715.04 (I)

Applicant should also describe how the attached evidence establishes reduction to practice or conception and diligence, for example, map out specific sections of Affadavit with respect to the claims.

Upon further consideration, examiner applied new reference in addition to the original set of claim rejections.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 (c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-5, 9-12, 16-19, 23, 26, 27, 30-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Susnow et al. (hereinafter Susnow), US 6,751,235.

4. As per claim 1, Susnow teaches a TCP-aware target adapter (Fig 3, item 360), for accelerating TCP/IP connections between a plurality of clients and a plurality of servers (Col. 3, lines 47-53), the plurality of servers being accessed via an Infiniband fabric (Col. 2, lines 55-60), the plurality of clients

being accessed via a TCP/IP network (Col. 6, lines 28-45, wherein the VI is an improvement of TCP/IP, VI contains transport level reliability functions, and is able to allow faster I/O communication between network devices), the TCP-aware target adapter comprising:

an accelerated connection processor, configured to bridge TCP/IP transactions between the plurality of clients and the plurality of servers (Fig 3, item 300), wherein said accelerated connection processor accelerates the TCP/IP connections by prescribing remote direct memory access operations to retrieve/provide transaction data from/to the plurality of servers (Col. 4, lines 40-41); and

a target channel adapter, coupled to said accelerated connection processor (Fig 3, item 340, 360), configured to support Infiniband operations with the plurality of servers, and configured to execute said remote direct memory access operations to retrieve/provide said transaction data (Col. 4, lines 40-41).

5. As per claim 2, Susnow teaches the TCP-aware target adapter as recited in claim 1, wherein said accelerated connection processor comprises:

a plurality of native network ports (Col. 3, lines 30-35, wherein each native protocol has ports between transmitter and receiver), each of said native network ports communicating with the plurality of clients in a native network protocol corresponding to the plurality of clients (Col. 10, lines 25-30).

6. As per claim 3, Susnow teaches the TCP-aware target adapter as recited in claim 2, wherein said native network protocol comprises one of the following protocols: Ethernet, Wireless Ethernet, Fiber Distributed Data Interconnect (FDDI), Attached Resource Computer Network (ARCNET), Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), and Token Ring (Col. 3, lines 30-35).

7. As per claim 4, Susnow teaches The TCP-aware target adapter as recited in claim 2, wherein said accelerated connection processor supports TCP/IP transactions with the plurality of clients by receiving/transmitting native transactions in accordance with said native network protocol (Col. 4, lines

30-54).

8. As per claim 5, Susnow teaches the TCP-aware target adapter as recited in claim 4, wherein each of a plurality of accelerated TCP/IP connections comprises:

a plurality of said remote direct memory access operations between a particular server and said target channel adapter to retrieve/provide particular transaction data from/to said particular server (Col. 4, lines 40-41); and

corresponding native transactions between said accelerated connection processor and a particular client to provide/retrieve said particular transaction data to/from said particular client (Col. 4, lines 30-54, wherein I/O and driver access to and from clients).

9. As per claim 9, claim 9 is rejected for the same reasons as rejection to claim 1 above.

10. As per claim 10, claim 10 is rejected for the same reasons as rejection to combination of claims 2 and 4 above.

11. As per claim 11, Susnow teaches the apparatus as recited in claim 9, wherein said connection acceleration driver comprises:

native queue logic (Col. 4, lines 1-13, wherein the host has its own memory/queue logic), configured to interpret a native network protocol corresponding to the clients, and configured to request/receive first Infiniband operations having native TCP/IP transactions to/from the clients that are embedded within Infiniband packets (Col. 4, lines 30-54, wherein the communication system example uses infiniband network, with bi-directional communications in place);

accelerated queue logic, configured to request second Infiniband operations to establish the accelerated TCP/IP connections, said second Infiniband operations designating said memory locations (Col. 4, lines 30-35); and

a transport driver interface mux, coupled to said accelerated queue logic, configured to receive said memory locations from application programs, and configured to provide said memory locations to said accelerated queue logic (see for example, Col. 4, lines 40-45, wherein read and write operations along with other memory access management teaches this section; Col. 5, lines 20-30; Col. 7, lines 40-55).

12. As per claim 12, Susnow teaches the apparatus as recited in claim 11, wherein said transport driver interface mux (Fig 6, item 620) is coupled via a transport driver interface to a TCP/IP stack within the server (wherein the transport driver is access to infiniband fabric as show in item 339 of Fig 4, and Col. 4, lines 25-35).

13. As per claim 16, Susnow teaches an apparatus within a client-server environment for managing an accelerated TCP/IP connection between a server connected to an Infiniband fabric and a client connected to a TCP/IP network, the apparatus comprising:

a host driver, for providing a host work queue through which transaction data corresponding to the accelerated TCP/IP connection is transmitted/received via the Infiniband fabric (Col. 2, lines 55-60; Col. 3, lines 45-55); and

a TCP-aware target adapter, coupled to said host driver, for providing a target work queue corresponding to said host work queue, and for executing a remote direct memory access operation to receive/transmit said transaction data via the Infiniband fabric (rejected for the same reasons as rejection to claim 1 above).

14. As per claim 17-19, claims 17-19 are rejected for the same reasons as rejection to claims 2-5 above respectively.

15. As per claim 23, claim 23 is rejected for the same reasons as combination of claims 1 and 6 above.

16. As per claim 26, claim 26 is rejected for the same reasons as rejection to claim 2 above.

17. As per claim 27, claim 27 is rejected for the same reasons as rejection to claim 1 and 2 above.

18. As per claim 30, claim 30 is rejected for the same reasons as rejection to claim 1 and 11 above.

19. As per claim 31, claim 31 is rejected for the same reasons as rejection to claim 2 above.

20. As per claim 32, Susnow teaches the TCP-aware target adapter as recited in claim 31, wherein said accelerated connection processor encapsulates outgoing TCP/IP transactions within Infiniband raw packets for transmission to the plurality of clients (wherein Susnow teaches native protocols existing on the server and client hosts, Col. 3, lines 30-35, furthermore, Susnow's invention deals with data communication on the Infiniband fabric, Col. 4, lines 55-57. Thus, in light of the above, a protocol transition/translation is inherently in place, furthermore, as data packet travel from one ISO layer to another, there is encapsulation occurring, since infiniband fabric is acting as a physical communications layer, any data packets coming from an upper layer would need to be encapsulated to be readily identifiable on the receiver side upon de-capsulation).

21. As per claim 33, claim 33 is rejected for the same reasons as rejection to claim 1 and 32 above.

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23. Claims 6-8, 13-15, 20-22, 24-25, 28-29, 34-36, 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susnow et al. (hereinafter Susnow), US 6,751,235, in view of Cheriton et al. (hereinafter Cheriton), US 6,675,200.

24. As per claim 6, Susnow does not explicitly teach the TCP-aware target adapter as recited in claim 5, wherein said accelerated connection processor comprises:

a connection correlator, configured to associate TCP/IP connection parameters with a target work queue number for said each of a plurality of accelerated TCP/IP connections.

25. Cheriton teaches:

a connection correlator, configured to associate TCP/IP connection parameters with a target work queue number for said each of a plurality of accelerated TCP/IP connections (Col. 3, lines 38-45, lines 54-57; Col. 4, lines 37-44).

26. It would have been obvious to one of ordinary skill in this art at the time of invention was made to combine the teaching of Susnow and Cheriton because they both dealing with remote memory access systems. Furthermore, the teaching of Cheriton to allow
a connection correlator, configured to associate TCP/IP connection parameters with a target work queue number for said each of a plurality of accelerated TCP/IP connections
would decrease the complexity for Susnow's system by utilizing existing protocols to improve TCP/IP speed.

27. As per claim 7, Susnow does not explicitly teach the apparatus as recited in claim 6, wherein TCP/IP connection parameters comprise: source TCP port number, destination TCP port number, source IP address, and destination IP address.

28. Cheriton teaches

wherein TCP/IP connection parameters comprise: source TCP port number, destination TCP port number, source IP address, and destination IP address (Fig 1, source and destination TCP port, and IP address would be inherently taught in the TCP/IP connection).

29. It would have been obvious to one of ordinary skill in this art at the time of invention was made to combine the teaching of Susnow and Cheriton because they both dealing with remote memory access systems. Furthermore, the teaching of Cheriton to allow
source TCP port number, destination TCP port number, source IP address, and destination IP address would decrease the complexity for Susnow's system by utilizing existing protocols to improve TCP/IP speed.

30. As per claim 8, Susnow teaches the TCP-aware target adapter as recited in claim 6, wherein said target work queue number corresponds to a host work queue number within a specific server (Col. 7, lines 40-55; Col. 8, lines 50-55, wherein synchronizing is a means to establish communications between remote queues of client and server, this is supported in rDMA between clients and servers, Col. 4, lines 40-41), said specific server being designated by said accelerated connection processor to support said each of a plurality of accelerated TCP/IP connections with a specific client (Col. 4, lines 30-55).

31. As per claim 13-15, claims 13-15 are rejected for the same reasons as rejection to claims 6-8 above respectively.

32. As per claims 20-21, claims 20-21 are rejected for the same reasons as rejection to claim 6 above.

33. As per claim 22, claim 22 is rejected for the same reasons as rejection to claim 7 above.

34. As per claim 24, Susnow teaches the method as recited in claim 23, wherein said mapping

comprises:

establishing Infiniband connections between the servers and a TCP-aware target adapter (Fig 3, links between 340, 300, 360).

35. Susnow does not explicitly teach:

intercepting the TCP/IP connection parameters from requests to send/receive data from/to the servers.

36. Cheriton teaches:

intercepting the TCP/IP connection parameters from requests to send/receive data from/to the servers (see for example, Col. 3, lines 38-45).

37. It would have been obvious to one of ordinary skill in this art at the time of invention was made to combine the teaching of Susnow and Cheriton because they both dealing with remote memory access systems. Furthermore, the teaching of Cheriton to allow
intercepting the TCP/IP connection parameters from requests to send/receive data from/to the servers would decrease the complexity for Susnow's system by utilizing existing protocols to improve TCP/IP speed.

38. As per claim 25, Susnow teaches the method as recited in claim 24, wherein said executing comprises:

providing the TCP-aware target adapter with memory locations within the servers for transmission/reception of the data (Col. 4, lines 1-13);

from the TCP-aware target adapter, transmitting the remote direct memory access operations to the servers (Col. 4, lines 40-41); and

from the servers, providing remote direct memory access responses (Col. 4, lines 40-41).

39. As per claim 28, claim 28 are rejected for the same reasons as rejection to 6 above.

40. As per claim 29, claim 29 are rejected for the same reasons as rejection to 6 above.

41. As per claim 34, claim 34 is rejected for the same reasons as rejection to claim 6 above.

42. As per claim 35, claim 35 is rejected for the same reasons as rejection to claim 7 above.

43. As per claim 37, claim 37 is rejected for the same reasons as rejection to claim 6 above. Examiner notes that the claim states 'unaccelerated', however, it is the infiniband fabric that is really accelerating the TCP/IP connections by transferring TCP packets on the infinband network. Thus, claim 6 with combination of Susnow's system teaches this claim.

44. As per claim 38, claim 38 is rejected for the same reasons as rejection to claim 7 above.

45. As per claim 39, claim 39 is rejected for the same reasons as rejection to combination of claim 8 and 37 above respectively.

46. Claims 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susnow et al. (hereinafter Susnow), US 6,751,235, in view of Johnson, US 6,591,310.

47. As per claim 40, Susnow teaches an Infiniband-to-native protocol translation apparatus (wherein Susnow teaches native protocols existing on the server and client hosts, Col. 3, lines 30-35, furthermore, Susnow's invention deals with data communication on the Infiniband fabric, Col. 4, lines 55-57. Thus, in light of the above, a protocol transition/translation is inherently in place), for routing TCP/IP transactions between a plurality of clients and a plurality of Infiniband devices, the plurality of Infiniband devices being accessed via an Infiniband fabric, the plurality of clients being

accessed via a TCP/IP network (Fig 3), the Infiniband-to-native protocol translation apparatus comprising:

an unaccelerated connection processor (wherein the infiniband network is doing the acceleration, the end processors are not accelerated), configured to bridge (Fig 3, item 300) the TCP/IP transactions between the plurality of clients and the plurality of Infiniband devices by encapsulating/stripping the TCP transactionswithin/from Infiniband raw packets, said unaccelerated connection processor comprising (as data packet travel from one ISO layer to another, there is encapsulation occurring, since infiniband fabric is acting as a physical communications layer, any data packets coming from an upper layer i.e. TCP/IP would need to be encapsulated to be readily identifiable on the receiver side upon de-capsulation) :

a target channel adapter, coupled to said unaccelerated connection processor, configured to receive/transmit said Infiniband raw packets from/to the plurality of Infiniband devices (Col. 4, lines 30-52).

47. Susnow does not explicitly teach:

an unaccelerated connection correlator, for mapping native addresses to/from Infiniband local indentifiers and work queue numbers.

48. Johnson teaches:

an unaccelerated connection correlator, for mapping native addresses to/from Infiniband local indentifiers and work queue numbers (Col. 10, lines 10-15; Col. 6, line 47, wherein infiniband is acting as transmission medium, native addresses are mapped to queue, Col. 6, line 65 – Col. 7, line 5; local infiniband identifiers are inherently available in the teaching of Johnson. Message identifiers are available for SCSI transmission medium see for example, Col. 8, lines 45-60, Johnson further discloses there are plurality of message transport mediums, including infiniband. Thus, in event of utilizing infiniband for Johnson, 'Infiniband Initiator mode Context Reply' and 'Infiniband Target mode Context

Reply' would be a part of the message header).

49. It would have been obvious to one of ordinary skill in this art at the time of invention was made to combine the teaching of Susnow and Johnson because they both dealing improving system I/O speeds. Furthermore, the teaching of Johnson to allow
an unaccelerated connection correlator, for mapping native addresses to/from Infiniband local indentifiers and work queue numbers
would improve the latency and communication costs for Susnow's system by quickly identifying the message contents (Col. 8, lines 35-40).

50. As per claim 41, Susnow does not explicitly teach the infiniband-to-native protocol translation apparatus as recited in claim 40, wherein said native address comprise MAC address.

51. Johnson teaches wherein said native address comprise MAC address (Col. 6, lines 66-67, wherein the MAC address is the physical address), it would have been obvious to combine teaching of Susnow and Johnson at least for the same reasons as rejection to claim 40 above.

52. As per claim 42, Susnow does not explicitly teach the Infiniband-to-native protocol translation apparatus as recited in claim 40, wherein said native addresses comprise IP addresses.

53. Johnson teaches wherein said native addresses comprise IP addresses (Col. 6, lines 66-67, wherein the IP address is the logical address), it would have been obvious to combine teaching of Susnow and Johnson at least for the same reasons as rejection to claim 40 above.

54. As per claim 43, Susnow teaches the Infiniband-to-native protocol translation apparatus as recited in claim 40, wherein said Infiniband local identifiers comprise source local identifier, destination local identifier, and work queue number (wherein the local identifiers of Infiniband are identified by the

memory write and read queues, as disclosed in Col. 4, lines 30-55, RMA calls are mapped to queues locally based on client and server transactions. This point is further disclosed in Col. 8, lines 50-55 and Col. 9, lines 50-55).

55. As per claim 44, Susnow teaches the Infiniband-to-native protocol translation apparatus as recited in claim 43, wherein said Infiniband local identifiers map said TCP/IP transactions between a particular client and a server connected to an Infiniband fabric (Fig 3, items 340, 300, 360).

56. As per claim 45, Susnow teaches the Infiniband-to-native protocol translation apparatus as recited in claim 43, wherein said Infiniband local identifiers map said TCP/IP transactions between a particular client and a TCP-aware target adapter connected to an Infiniband fabric (Fig 3, items 340, 300, 360).

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Claim Rejections - 35 USC § 102

57. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 (c) of this title before the invention thereof by the applicant for patent.

58. Claims 1-6, 8-13, 15-21, 23-34, 37, 40, 43-45 are rejected under 35 U.S.C. 102(e) as being anticipated by Beukema et al. (hereinafter Beukema), US 2002/0073257.

59. As per claim 1, Beukema teaches a TCP-aware target adapter, for accelerating TCP/IP connections between a plurality of clients and a plurality of servers, the plurality of servers being accessed via an Infiniband fabric, the plurality of clients being accessed via a TCP/IP network, the TCP-aware target adapter comprising:

an accelerated connection processor, configured to bridge TCP/IP transactions between the plurality of clients and the plurality of servers, wherein said accelerated connection processor accelerates the TCP/IP connections by prescribing remote direct memory access operations to retrieve/provide transaction data from/to the plurality of servers (pg 2, [0023], [0020]; pg 3, [0034]); and

a target channel adapter, coupled to said accelerated connection processor, configured to support Infiniband operations with the plurality of servers, and configured to execute said remote direct memory access operations to retrieve/provide said transaction data (pg 4, [0047]; pg 5, [0053]).

60. As per claim 2, Beukema teaches the TCP-aware target adapter as recited in claim 1, wherein said accelerated connection processor comprises:

a plurality of native network ports, each of said native network ports communicating with the plurality of clients in a native network protocol corresponding to the plurality of clients (pg 2, [0024]; pg 1, [0007]).

61. As per claim 3, Beukema teaches the TCP-aware target adapter as recited in claim 2, wherein said native network protocol comprises one of the following protocols: Ethernet, Wireless Ethernet, Fiber Distributed Data Interconnect (FDDI), Attached Resource Computer Network (ARCNET), Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), and Token Ring (pg 3, [0032]).

62. As per claim 4, Beukema teaches The TCP-aware target adapter as recited in claim 2, wherein said accelerated connection processor supports TCP/IP transactions with the plurality of clients by receiving/transmitting native transactions in accordance with said native network protocol (pg 1, [0007]).

63. As per claim 5, Beukema teaches the TCP-aware target adapter as recited in claim 4, wherein each of a plurality of accelerated TCP/IP connections comprises:

a plurality of said remote direct memory access operations between a particular server and said target

channel adapter to retrieve/provide particular transaction data from/to said particular server (pg 2, [0020]; pg 3, [0034]; pg 4, [0047]); and

corresponding native transactions between said accelerated connection processor and a particular client to provide/retrieve said particular transaction data to/from said particular client (pg 3, [0036]; pg 5, [0053]).

64. As per claim 6, Beukema teaches the TCP-aware target adapter as recited in claim 5, wherein said accelerated connection processor comprises:

a connection correlator, configured to associate TCP/IP connection parameters with a target work queue number for said each of a plurality of accelerated TCP/IP connections (pg 4, [0039] – [0041]).

65. As per claim 8, Beukema teaches the TCP-aware target adapter as recited in claim 6, wherein said target work queue number corresponds to a host work queue number within a specific server, said specific server being designated by said accelerated connection processor to support said each of a plurality of accelerated TCP/IP connections with a specific client (pg 4, [0039] – [0041], [0043]).

66. As per claim 9, claim 9 is rejected for the same reasons as rejection to claim 1 above.

67. As per claim 10, claim 10 is rejected for the same reasons as rejection to combination of claims 2 and 4 above.

68. As per claim 11, Beukema teaches the apparatus as recited in claim 9, wherein said connection acceleration driver comprises:

native queue logic, configured to interpret a native network protocol corresponding to the clients, and configured to request/receive first Infiniband operations having native TCP/IP transactions to/from the clients that are embedded within Infiniband packets (pg 2, [0023]; pg 3, [0034]);

accelerated queue logic, configured to request second Infiniband operations to establish the

accelerated TCP/IP connections, said second Infiniband operations designating said memory locations (pg 2, [0034]); and

a transport driver interface mux, coupled to said accelerated queue logic, configured to receive said memory locations from application programs, and configured to provide said memory locations to said accelerated queue logic (pg 1, [0007]; pg 8, [0082]).

69. As per claim 12, Beukema teaches the apparatus as recited in claim 11, wherein said transport driver interface mux is coupled via a transport driver interface to a TCP/IP stack within the server (pg 1, [0007]; pg 8, [0082]; pg 2, [0023]).

70. As per claim 13 and 15, claims 13 and 15 are rejected for the same reasons as rejection to claims 6 and 8 above respectively.

71. As per claim 16, Beukema teaches an apparatus within a client-server environment for managing an accelerated TCP/IP connection between a server connected to an Infiniband fabric and a client connected to a TCP/IP network, the apparatus comprising:

a host driver, for providing a host work queue through which transaction data corresponding to the accelerated TCP/IP connection is transmitted/received via the Infiniband fabric (pg 3, [0037]; pg 6, [0068]; pg 7, [0069], [0070]); and

a TCP-aware target adapter, coupled to said host driver, for providing a target work queue corresponding to said host work queue, and for executing a remote direct memory access operation to receive/transmit said transaction data via the Infiniband fabric (rejected for the same reasons as rejection to claim 1 above).

72. As per claim 17-20, claims 17-20 are rejected for the same reasons as rejection to claims 2-6 above respectively.

73. As per claim 21, claim 21 is rejected for the same reasons as rejection to claim 6 above.

74. As per claim 23, claim 23 is rejected for the same reasons as combination of claims 1 and 6 above.

75. As per claim 24, Beukema teaches the method as recited in claim 23, wherein said mapping comprises:

i) intercepting the TCP/IP connection parameters from requests to send/receive data from/to the servers (pg 4, [0039] – [0041]); and

ii) establishing Infiniband connections between the servers and a TCP-aware target adapter (pg 1, [0007]).

76. As per claim 25, Beukema teaches the method as recited in claim 24, wherein said executing comprises:

i) providing the TCP-aware target adapter with memory locations within the servers for transmission/reception of the data (pg 4, [0039] – [0041]);

ii) from the TCP-aware target adapter, transmitting the remote direct memory access operations to the servers; and

iii) from the servers, providing remote direct memory access responses (pg 4, [0039], [0047]).

77. As per claim 26, Beukema teaches the method as recited in claim 23, further comprising:

c) generating TCP/IP transactions in a native network protocol to provide the data to the clients (pg 1, [0007]).

78. As per claim 27-28, claims 27-28 are rejected for the same reasons as rejection to claims 1 and 6 above respectively.

79. As per claim 29, Beukema teaches the method as recited in claim 28, wherein said generating comprises:

i) formulating TCP headers, IP headers, and native network headers for messages to/from the clients based upon the TCP/IP connection parameters provided by said associating (pg 4, [0039]; pg 2, [0023]).

80. As per claims 30-31, claims 30-31 are rejected for the same reasons as rejection to claims 1-2 above respectively.

81. As per claim 32, Beukema teaches the TCP-aware target adapter as recited in claim 31, wherein said accelerated connection processor encapsulates outgoing TCP/IP transactions within Infiniband raw packets for transmission to the plurality of clients (pg 2, [0023]).

82. As per claim 33, claim 33 is rejected for the same reasons as rejection to combination of claims 1 and 2 above.

83. As per claim 34, claim 34 is rejected for the same reasons as rejection to claim 6 above.

84. As per claim 37, Beukema teaches the TCP-aware target adapter as recited in claim 33, wherein said connection correlator associates native connection parameters with a target work queue number for said each of a plurality of unaccelerated TCP/IP connections (pg 4, [0039] – [0041]).

85. As per claim 40, Beukema teaches an Infiniband-to-native protocol translation apparatus, for routing TCP/IP transactions between a plurality of clients and a plurality of Infiniband devices, the plurality of Infiniband devices being accessed via an Infiniband fabric, the plurality of clients being accessed via a TCP/IP network, the Infiniband-to-native protocol translation apparatus comprising:

an unaccelerated connection processor, configured to bridge the TCP/IP transactions between the

plurality of clients and the plurality of Infiniband devices by encapsulating/stripping the TCP transactionswithin/from Infiniband raw packets, said unaccelerated connection processor comprising(pg 3, [0034], [0035]) :

an unaccelerated connection correlator, for mapping native addresses to/from Infiniband local indentifiers and work queue numbers (pg 4, [0039]-[0041]); and

a target channel adapter, coupled to said unaccelerated connection processor, configured to receive/transmit said Infiniband raw packets from/to the plurality of Infiniband devices (pg 3, [0034]).

86. As per claim 43, Beukema teaches the Infiniband-to-native protocol translation apparatus as recited in claim 40, wherein said Infiniband local identifiers comprise source local identifier, destination local identifier, and work queue number (pg 4, [0039]-[0041]).

87. As per claim 44, Beukema teaches the Infiniband-to-native protocol translation apparatus as recited in claim 43, wherein said Infiniband local identifiers map said TCP/IP transactions between a particular client and a server connected to an Infiniband fabric (pg 2, [0020]).

88. As per claim 45, Beukema teaches the Infiniband-to-native protocol translation apparatus as recited in claim 43, wherein said Infiniband local identifiers map said TCP/IP transactions between a particular client and a TCP-aware target adapter connected to an Infiniband fabric (pg 1, [0007]).

Claim Rejections - 35 USC § 103

89. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

90. Claims 7, 14, 22, 35-36, 38-39, 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beukema et al. (hereinafter Beukema), US 2002/0073257 in view of 'Official Notice'.

91. As per claim 7, Beukema does not explicitly teaches the TCP-aware target adapter as recited in claim 6, wherein said TCP/IP connection parameters comprise:

source TCP port number, destination TCP port number, source IP address, and destination IP address. "Official Notice" is taken that the concept and advantages of providing for port number and the address information is well known and expected in the art. It would have been obvious to one of ordinary skill in the art to include said information with Beukema because it would provide for a way of identifying the location of end nodes. Furthermore, applicant admitted that said information is standardized when transfer of packets thus they are rendered obvious for those ordinary skill in the art.

92. As per claim 14, 22, 35 and 42, Claims 14, 22, 35 and 42 are rejected for the same reasons as rejection to claim 7 above respectively.

93. As per claim 36, claim 36 is rejected for the same reasons as rejection to claim 6 and 7 above respectively.

94. As per claim 38, Beukema does not explicitly teaches the TCP-aware target adapter as recited in claim 37, wherein said native connection parameters comprise:

source MAC address and destination MAC address.

"Official Notice" is taken that the concept and advantages of providing for the MAC address information is well known and expected in the art. It would have been obvious to one of ordinary skill in the art to include said information with Beukema because it would provide for a way of identifying the physical location of end nodes, essential to make routing possible. Furthermore, applicant admitted that said information is standardized when transfer of packets thus they are rendered obvious for those

ordinary skill in the art.

95. As per claim 39, claim 39 is rejected for the same reasons as rejection to claim 6 above.

96. As per claim 41, claim 41 is rejected for the same reasons as rejection to claim 38 above.

Conclusion

97. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents and publications are cited to further show the state of the art with respect to "Infiniband work queue to TCP/IP Translation"

i.	US 6243787	Kagan et al.
ii.	US 6594329	Susnow et al.
iii.	US 6661773	Pelissier et al.
iv.	US 6690757	Bunton et al.
v.	US 6591310	Johnson
vi.	US 6535518	Hu et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad Zhong whose telephone number is (571)272-3946. The examiner can normally be reached on M-F 7:15 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BURGESS, GLENTON B can be reached on (571)272-3949. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CZ
January 12, 2005

Bradley Edelman
Art Unit 2153